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March 1, 1988

ORIGINAL
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Federal Communications Commission
Washington, DC

Gentlemen:

Federal Communications Commission
Office of the Secretary

A common complaint today is, "We blew it on VCRs and we're about to blow it on HDTV."

This is a proposal to avoid blowing it on HDTV. The proposal is essentially to skip the HDTV phase altogether, and push for conversion to full-digital TV, a far better conversion that is bound to come eventually, at the earliest practical time.

Background Element #1. CD systems reproduce sound as good as the human ear can hear; thus, in the most important aspect, they are the ultimate in their area. The CD 'player' is basically a computer system, all digital, with a *directory* on each disk to enable accessing the various 'files' on the disk in any sequence.

Background Element #2. A CD can be used to store an encyclopedia, complete with color illustrations. This has the advantage over paper-based encyclopedias that the CD directory enables quickly finding each occurrence of a desired word or subject, not just the main one in alphabetical sequence. Thus, one could easily find each occurrence of the word 'cabbage', whether under cabbage proper, kraut, cole, or *Brassica oleracea*, and thus find the other varieties of the species, such as broccoli. CD ROMs are now routinely used with computers of already low cost.

I noted that in many cases the encyclopedia illustrations would be better as movies, especially to show how to do something or how something works, and, in further contrast to the paper encyclopedia, why not include sound, in stereo? Think of a bird encyclopedia, with artists' rendering of the birds, close-up, and movies of them in flight, and stereos of their calls. It is the directory that would enable quickly finding the bird of interest, whether by name or by description. Steve Jobs has announced stereo audio for the NeXT computer. Further, with a good-enough screen, which Jobs may have, the video could be as good as the human eye can see. A coarser image could be presented on a hi-fi video screen.

Background Element #3. A few years ago, during the wee hours, surgery lessons were broadcast via satellite channels, not for viewing, but for recording on VCR, followed by careful study. The approach enabled the surgeons best at certain procedures to demonstrate the operations for other surgeons to emulate. For that application, VCR recording, in light of fast-forward, rewind, and still/pause, was probably adequate, but tape has all the disadvantages of a sequential system. It would have been better to have had the lessons in digital form, so that the student surgeon could have selected, instantly, by title, the lesson and section to be reviewed.

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Background Element #4. The Mapping Centers of the US Geological Survey are, over the next 5 to ten years, converting their primary database from paper maps to digital files. This will facilitate the instant creation of maps representing various combinations of elements, such as topography, drainage, soil type, and geology; it is impossible to show everything that is significant on any one map. For cruise missiles, of course, the map data are necessarily digital. This is intended only to emphasize the trend to, and advantages of, digital.


A big step will be to view the function of TV in a different manner from how it is now largely seen, that is, as a vehicle principally for advertizing and entertainment. Not that advertizing and entertainment will be impeded; they will be enhanced by the near-perfect picture of digital display. But the availability of a computer-readable directory for a recorded file will enable use of TV in a major informational, or educational, role, specifically, distributing books. (Recall, please, that Dr. Richard Feynman's book showed that textbook publishers are failing to provide good books and that subsequent discussion yielded compelling reasons why the textbook industry cannot profitably provide any good books.) But a well-done 'book', with sharp color movies and stereo sound, will be fun to study. Think of language lessons, say, Spanish, taught by master teachers, from the Prado where the vehicles could be art masterpieces, and the pronunciation precise, all on CD, so that the student could access instantly the part needed. By broadcasting such books, TV can lead to much education outside of schools, but, realistically, in an earlier day, homework may have been our main means of education!

So, what is holding it up? For one thing, we do not now have a fast, economical digital data-recording system with the capacity needed for digital TV. The ubiquitous VCR provides 6 hours recording; a new system should do no less. Probably, for reasons of bandwidth, fewer broadcast channels will be possible with really sharp digital TV, but satellite transmission can offset the difference. The best of monitors today are perhaps marginally adequate for 'good as the eye can see' display. Entertainment artists will raise the same arguments against digital TV as they are raising about DAT. Can our Nation, already badly behind in education, afford to let such complaints interfere? Much development work on digital TV is needed. The main thing that we need is a National commitment to get on with it.

Conversion to HDTV would be very costly, for broadcasters, cable operators, and for the public, all of whose TVs, VCRs, and video cameras will be obsoleted. But recorders will still be analog and sequential. Conversion to digital TV, when it comes, will be very costly, too. Please, skip HDTV and do not put America through such change twice.

If we get on the ball, the USA can take the lead in full-digital TV. If we switch to HDTV, we will expend a great deal of capital overseas, capital that our world competitors will be able to use in the development of full-digital TV.

I am retired, have no pertinent investments, and no axe to grind. I am scared over the state of education in the USA.

Sincerely,

Robert M. Doerr

July 22, 1989

ADDENDUM

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A related system has appeared on the market. It requires the use of a powerful personal computer, a TV, a video disk system, and special hardware at a price of \$3000.

An anecdotal description of the use of the system was this. A boy asked his father something about elephants. The father replied, "Look it up." So, the boy went to the computer to look it up and soon faced a herd of elephants charging toward him on the screen, with stereo sound. Clearly, this is just a gimmick. But, then the boy spent hours at the computer, browsing the literature. When one considers how exceedingly poorly we help our young people to learn what interests them, really interests them deeply enough to make it their life work, such browsing is overwhelmingly important.

But such a complicated system will not be available to most of those who need it; the cost is excessive. And the \$3000 could not begin to cover a needed collection of encyclopedias on a wide-ranging wealth of fields. But personal computers will be ubiquitous. Books, broadcast for use with computers, and with moving-picture illustrations can be the answer.

ROBERT M. DOERR
39 McFarland Drive
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February 25, 1989

RECEIVED BY
JUL 24 1989
FCC MAIL BRANCH

Senator John Danforth
Senate Office Building
Washington, DC

COPY

Dear Senator Danforth:

Because my proposal, copy herewith, touches on educational considerations and perhaps on Japanese-style government-pushed inter-company development, outside the purview of the FCC, I urgently request that, if you see value in it, you pursue it for me; your purview is not so limited.

The best use that I have seen of CDs for computers is in the library at Washington U.; a good subset is in use at UM - Rolla. The Rolla Public Library is about to install a CD system to enable patrons to learn what is available in other libraries in a substantial region. Of course, these are but text applications.

I thought of stereo audio on computers before Steve Jobs announced it for NeXT.

On another matter, one R. Dugger researched and wrote a major piece on election fraud (*New Yorker*, November 7, 1988). He pointed to a need for government-provided public-domain election computer software. One company, and probably one person, controls the trade secret program that is used to count some 40 percent of ballots in the USA, including here in Phelps County. The computer used for elections became obsolete about a decade ago; indeed, at the Bureau of Mines, we replaced it with a much more competent 'toy' computer from Radio Shack. Several of the machines of the type used for elections were used back then at UM - Rolla.

Sincerely,

Robert M. Doerr